

Job# 8-5156

Dixie Carriers

SC- 1904

August 12, 1996

HER 03457

HERCULES

MARINE SERVICES CORPORATION

P. O. Drawer O • Freeport, Texas 77541

INVOICE NO. 3523

DATE August 23, 1996

Job No. 5156

Location Freeport TX

TO: Dixie Carriers
2102 Broadway
Freeport, TX 77012

PLEASE REMIT PAYMENTS TO:
11011 RICHMOND
SUITE 600
HOUSTON, TX. 77042

Terms : Net 30

FOR: Service to SC-1904

On 8/11/96 Filled with nitrogen.

LABOR:	Foreman	3 (O/T)	@	53.25	159.75
	Journeyman	3 (O/T)	@	45.75	137.25

Total amount invoice due \$ 297.00

PHONE: (409) 233-6371

HER 03458

Strength through Experience, Equipment, Know-How

Job Workscope/Breakdown

Job No: 8-5756 Date: Aug 17 Invoice Number: _____
 Customer: B. Dipe Cariera Barge/M/V: SC-1904

Foreman:	S/T	_____	@	38.00	_____
	O/T	<u>3</u>	@	53.25	<u>159.75</u>
Leadman:	S/T	_____	@	35.00	_____
	O/T	_____	@	49.50	_____
Journeyman:	S/T	_____	@	32.50	_____
	O/T	<u>3</u>	@	45.75	<u>137.25</u>
Disposal:	Slop Oil	_____	@	0.60	_____
	Water	_____	@	0.35	_____
Water:	_____	_____	@	5.00/1,000 gal	_____
Material:	_____	_____	Plus 25%	_____	_____
Stock:	_____	_____	Plus 25%	_____	_____
Chemist:	_____	_____	Plus 25%	_____	_____
Equipment:	Compressor	_____	@	48.00	_____
	Air Movers	_____	@	5.00	_____
	Forklift	_____	@	30.00	_____
	Tugboat	_____	@	100.00	_____
	Steam Rig	_____	@	100.00	_____
	Vacuum	_____	@	30.00	_____
	Hand Hose	_____	@	12.00	_____
	Weld Machine	_____	@	15.00	_____
	Cherry Picker	_____	@	70.00	_____
	Crane	_____	@	130.00	_____
	3" Gas Pump	_____	@	18.00	_____
	2" Strip Pump	_____	@	15.00	_____
	Butterworth	_____	@	10.00	_____
	4" Elec. Pump	_____	@	15.00	_____
	Cutting Rig	_____	@	8.00	_____
	Haul Out	_____	@	1,100.00	_____
	Truck	_____	@	25.00	_____
	Hand Tools	_____	@	10.00	_____

Total Invoice:

9 297.00

HER 03459

DAILY TIME LOG

DATE:	8/11/92	CUSTOMER:	DEKIE
JOB NO:	8-5156	BARGE:	

START TIME _____

STOP TIME _____

[illegible]

MATERIAL LIST:

JOB DESCRIPTION:

UCISCO, INC.

A PRAXAIR SERVICE COMPANY

THE PLAZA AT COMMERCE PARK NORTH
222 PENNBRIGHT, SUITE 300
HOUSTON, TEXAS 77090-5999 (713) 872-2229

SERVICE AGREEMENT
No. 45094

BILLING INFORMATION	Customer <u>DIXIE CARRIERS</u>		Customer Code <u>1310-01623</u>	
	Address <u>2102 Broadway</u>			
	City <u>HOUSTON</u>	State <u>TX</u>	Zip <u>77012-3806</u>	Phone _____
	P.O. No. _____		Tax Exempt No. _____	
JOB LOCATION	City <u>FROST</u>	County <u>BEZARIA</u>	State <u>TX</u>	Zip _____
	Time & Date Needed <u>2000 8-11-96</u>		District _____	
DISPATCH INFORMATION	Rate Sch. <input type="checkbox"/> Quotation <input type="checkbox"/> No. _____		No Service <input type="checkbox"/>	
	Description of Service <u>CASCADE Fill on BALLER</u>			
	Market Served <u>M</u> <input type="checkbox"/> NPS <input type="checkbox"/> PCSFT <input type="checkbox"/> PCSPL <input type="checkbox"/> PCSHX <input type="checkbox"/> TT <input type="checkbox"/> Other _____			
WARNING	1. PRE-JOB DISCUSSION WAS HELD & SAFETY CHECK LIST COMPLETED. <u>JK</u> Initial 2. CUSTOMER HAS RECEIVED A COPY OF SAFETY PRECAUTIONS. <u>JK</u> Initial			

HAZARDOUS <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO	ORIGIN (PROCESS)	IDENTITY/ DESCRIPTION <u>EDC</u>	CHEMICAL CONSTITUENTS	DISPOSAL SITE/ DISPOSITION
The undersigned acknowledges that the information provided above with respect to Wastes (as defined in paragraph 9 of the terms and conditions specified on the reverse side hereof) represents the best knowledge of the Customer with respect to such Wastes. The undersigned further acknowledges that a pre-job discussion was held, a safety check list was completed, and that he has received and read the safety precautions and hereby approves, accepts and authorizes the services described herein to be performed in accordance with the terms and conditions specified on the reverse side of this service agreement. Unless prices are quoted, all prices will be according to UCISCO's rate schedule in effect at the time of the services.				

AUTHORIZED SIGNATURE <u>Roger S. [Signature]</u>	TITLE <u>Operator</u>	DATE <u>8-11-96</u>
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EQUIPMENT	UNIT 1	TYPE	UNIT 2	TYPE
Unit No. & Type	<u>9043</u>	<u>230</u>		
Date & Time Out	<u>8-11-96</u>	<u>11:30</u>		
Date & Time On Site	<u>8-11-96</u>	<u>2000</u>		
Date & Time Started	<u>8-11-96</u>	<u>2000</u>		
Date & Time Completed	<u>8-11-96</u>	<u>21:00</u>		
Date & Time In	<u>8-11-96</u>			
TOTAL N ₂ UNIT HOURS				
SANDJET RUNS				
Additional Sandjet Runs				
Additional Hours				
Additional Days				
TOTAL N ₂ USED (NPS ONLY)	<u>SCALES</u>			
EQUIPMENT MILEAGE				
Roundtrip Miles From:	<u>LAPORTE</u>			
Allowed Miles Per N ₂ Unit	<u>140</u>			
Chargeable Miles	<u>140</u>	x No. of Units	<u>1</u>	
TOTAL CHARGEABLE MILES				

**THIS AREA IS FOR
UCISCO ACCOUNTING
USE ONLY**

TRANSPORT MILEAGE AND TIME		ADDITIONAL WORK	
Roundtrip Miles From:		The undersigned authorizes UCISCO to perform the additional services described here at the "additional charges" price contained in UCISCO's quotation or the price specified. A. Description of additional service _____	
Allowed Miles Per Transport		B. Price for additional services <input type="checkbox"/> Quotation <input type="checkbox"/> Other: (Describe) _____	
Chargeable Miles	x No. of Transports		
TOTAL CHARGEABLE MILES			
Total Transport Time On Site			
Total Chargeable Transport Time			
I hereby acknowledge that the above information is correct and the services have been completed.		Customer Signature _____ Date _____	
Authorized Signature <u>Roger S. [Signature]</u>		REMARKS _____	
Title <u>Operator</u> Date <u>8-11-96</u>			
UCISCO Representative <u>[Signature]</u>			

HAZARD COMMUNICATION DATA HAZARD COMMUNICATION DATA

UCISCO

A PRAXAIR SERVICE COMPANY

HAZARD COMMUNICATION DATA

NOTICE: Make certain that the information contained in this envelope reaches each person who may use or come in contact with the products and services covered herein.

THIS ENVELOPE CONTAINS:

_____ NITROGEN SERVICES HAZARD DATA
_____ SANDJET® SERVICES HAZARD DATA
_____ InnerCleanSM PIPELINE CLEANING SERVICES HAZARD DATA
_____ mini-SANDJET® SERVICES HAZARD DATA
_____ OTHER SERVICES
_____ OTHER SERVICES
_____ OTHER SERVICES
_____ OTHER SERVICES

Date Envelope Prepared
or Last Checked _____

FOR ADDITIONAL INFORMATION CONTACT

HER 03462

OR

UCISCO, 222 PENNBRIGHT, HOUSTON, TEXAS 77090
(713) 872-2188

HAZARD COMMUNICATION DATA HAZARD COMMUNICATION DATA

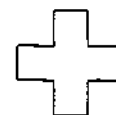
UC-001 (5/96)
ARMADILLO PRESS (713) 586-9383

MATERIAL SAFETY DATA SHEET

L-4631-D
December 1992



An explanation of the terms used herein may be found in OSHA 29 CFR 1910.1200,
available from OSHA regional or area offices.
(Essentially similar to US Department of Labor Form OMB No. 1218-0072)
Do Not Duplicate This Form. Request an Original.



I. PRODUCT IDENTIFICATION

PRODUCT	Nitrogen		
CHEMICAL NAME	Nitrogen	SYNONYMS	Not applicable
FORMULA	N ₂	CHEMICAL FAMILY	Not applicable
		MOLECULAR WEIGHT	28.01
TRADE NAME	Nitrogen		

II. HAZARDOUS INGREDIENTS

For mixtures of this product request the respective component Material Data Safety Sheets. See Section IX.

MATERIAL (CAS NO.)	Wt (%)	1992-1993 ACGIH TLV-TWA (OSHA-PEL)
Nitrogen (7727-37-9)	100	Simple asphyxiant (None currently established)

III. PHYSICAL DATA

BOILING POINT, 760 mm. Hg	-195.8°C (-320.46°F)	FREEZING POINT	-210°C (-345.8°F)
SPECIFIC GRAVITY (H ₂ O = 1)	Gas	VAPOR PRESSURE AT 20°C.	Gas
VAPOR DENSITY (air = 1)	0.967	SOLUBILITY IN WATER, % by wt.	Negligible
PERCENT VOLATILES BY VOLUME	100	EVAPORATION RATE (Butyl acetate = 1)	Not applicable

APPEARANCE AND ODOR Colorless, odorless gas at normal temperature and pressure.

EMERGENCY PHONE NUMBER

IN CASE OF EMERGENCIES involving this material, further information is available at all times:

Call CHEMTREC 800-424-9300 only in the event of chemical emergencies involving a spill, leak, fire, exposure or accident involving chemicals. For routine information contact your supplier.

This product is subject to the Pennsylvania Worker and Community Right-To-Know Act (35 P.S. Sections 7301-7320).

Praxair requests the users of this product to study this Material Safety Data Sheet (MSDS) and become aware of product hazards and safety information. To promote safe use of this product a user should (1) notify its employees, agents and contractors of the information on this MSDS and any product hazards and safety information, (2) furnish this same information to each of its customers for the product, and (3) request such customers to notify their employees and customers for the product of the same product hazards and safety information.

PRAXAIR, INC.

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IV. HEALTH HAZARD DATA

THRESHOLD LIMIT VALUE: See Section II.

EFFECTS OF A SINGLE (ACUTE) OVEREXPOSURE:

SWALLOWING—This product is a gas at normal temperature and pressure.

SKIN ABSORPTION—No evidence of adverse effects from available information.

INHALATION—Asphyxiant. Moderate concentrations may cause headache, drowsiness, dizziness, excitation, excess salivation, vomiting and unconsciousness. Lack of oxygen can cause death.

SKIN CONTACT—No harmful effect expected from vapor. Liquid may cause frostbite.

EYE CONTACT—No harmful effect expected from vapor.

EFFECTS OF REPEATED (CHRONIC) OVEREXPOSURE: No evidence of adverse effects from available information.

OTHER EFFECTS OF OVEREXPOSURE: Contact with liquid may cause frostbite.

MEDICAL CONDITIONS AGGRAVATED BY OVEREXPOSURE: The toxicology and the physical and chemical properties of the material do not suggest that overexposure is likely to aggravate existing medical conditions.

SIGNIFICANT LABORATORY DATA WITH POSSIBLE RELEVANCE TO HUMAN HEALTH HAZARD EVALUATION: None currently known.

EMERGENCY AND FIRST AID PROCEDURES:

SWALLOWING—This product is a gas at normal temperature and pressure.

SKIN CONTACT—For exposure to liquid, immediately warm frostbite area with warm water (not to exceed 105°F). In case of massive exposure, remove clothing while showering with warm water. Call a physician.

INHALATION—Remove to fresh air. Give artificial respiration if not breathing. Give oxygen if breathing is difficult. Call a physician.

EYE CONTACT—In case of splash contamination, immediately flush eyes thoroughly with water for at least 15 minutes. See a physician, preferably an ophthalmologist, immediately.

NOTE TO PHYSICIAN: *There is no specific antidote. Treatment should be directed at the control of symptoms and the clinical condition.*

NOTE: *Suitability for use as a component in underwater breathing gas mixtures is to be determined by or under the supervision of personnel experienced in the use of underwater breathing gas mixtures and familiar with the effects, methods, frequency and duration of use, hazards, side effects and precautions to be taken.*

PRODUCT: Nitrogen

L-4631-D
December 1992

V. FIRE AND EXPLOSION HAZARD DATA

FLASH POINT (test method)	Not applicable	AUTOIGNITION TEMPERATURE	Not applicable
FLAMMABLE LIMITS IN AIR, % by volume	LOWER	Not applicable	UPPER
			Not applicable

EXTINGUISHING MEDIA: Nitrogen cannot catch fire. Use media appropriate for surrounding fire.

SPECIAL FIRE FIGHTING PROCEDURES: Evacuate all personnel from danger area. Immediately deluge containers with water spray from maximum distance until cool, then move containers away from fire area if without risk.

UNUSUAL FIRE AND EXPLOSION HAZARDS: Gas cannot catch fire. Container may rupture due to heat of fire. No part of a container should be subjected to a temperature higher than 52°C (approximately 125°F). Most containers are designed to vent contents when they are exposed to elevated temperature.

VI. REACTIVITY DATA

STABILITY	
UNSTABLE	STABLE
	X

CONDITIONS TO AVOID: See Section IX.

INCOMPATIBILITY (materials to avoid): Under certain conditions, nitrogen can react violently with lithium, neodymium, titanium, ozone.

HAZARDOUS DECOMPOSITION PRODUCTS: None.

HAZARDOUS POLYMERIZATION	
May Occur	Will not Occur
	X

CONDITIONS TO AVOID: None currently known.

VII. SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IF MATERIAL IS RELEASED OR SPILLED: Evacuate all personnel from danger area. Use self-contained breathing apparatus where needed. Shut off leak if without risk. Ventilate area of leak or move leaking container to well-ventilated area. Test area, especially confined areas, for sufficient oxygen content prior to permitting re-entry of personnel.

WASTE DISPOSAL METHOD: Slowly release into atmosphere. Discard any product, residue, disposable container or liner in an environmentally acceptable manner, in full compliance with federal, state and local regulations.

HER 03465

PRODUCT: Nitrogen

L-4631-D
December 1992

VIII. SPECIAL PROTECTION INFORMATION

RESPIRATORY PROTECTION (specify type): None required under normal use. However, air supplied respirators are required while working in confined spaces with this product. The respiratory protection use must conform with OSHA rules as specified in 29 CFR 1910.134.

VENTILATION	LOCAL EXHAUST—Use local exhaust system, if necessary, to prevent the build up of an oxygen deficient atmosphere.
	MECHANICAL (general)—Acceptable
	SPECIAL—None
	OTHER—None

PROTECTIVE GLOVES: Preferred for cylinder handling.

EYE PROTECTION: Select in accordance with OSHA 29 CFR 1910.133.

OTHER PROTECTIVE EQUIPMENT: Metatarsal shoes for cylinder handling. Select in accordance with OSHA 29 CFR 1910.132 and 1910.133.

IX. SPECIAL PRECAUTIONS

CAUTION: High pressure gas. Use piping and equipment adequately designed to withstand pressures to be encountered. Can cause rapid suffocation due to oxygen deficiency. Store and use with adequate ventilation. Close valve when not in use and when empty.

MIXTURES: When two or more gases, or liquefied gases are mixed, their hazardous properties may combine to create additional, unexpected hazards. Obtain and evaluate the safety information for each component before you produce the mixture. Consult an Industrial Hygienist or other trained person when you make your safety evaluation of the end product. Remember, gases and liquids have properties which can cause serious injury or death. Be sure to read and understand all labels and other instructions supplied with all containers of this product. For safety information of general handling of compressed gas cylinders, it is recommended that a copy of pamphlet P-1, "Safe Handling of Compressed Gas in Containers," be obtained from the Compressed Gas Association, Inc., 1725 Jefferson Davis Highway, Suite 1004, Arlington, VA 22202.

OTHER HANDLING AND STORAGE CONDITIONS: Never work on a pressurized system. If there is a leak, close the cylinder valve, blow down the system by venting to a safe place, then repair the leak.

The opinions expressed herein are those of qualified experts within Praxair, Inc. We believe that the information contained herein is current as of the date of this Material Safety Data Sheet. Since the use of this information and these opinions and the conditions of use of the product are not within the control of Praxair, Inc., it is the user's obligation to determine the conditions of safe use of the product.



GENERAL OFFICES

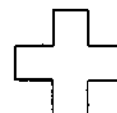
Praxair, Inc.
39 Old Ridgebury Road
Danbury, CT 06810-5113

MATERIAL SAFETY DATA SHEET

L-4630-E
December 1992



An explanation of the terms used herein may be found in OSHA 29 CFR 1910.1200,
available from OSHA regional or area offices.
(Essentially similar to US Department of Labor Form OMB No. 1218-0072)
Do Not Duplicate This Form. Request an Original.



I. PRODUCT IDENTIFICATION

PRODUCT	Nitrogen (Cryogenic Liquid)		
CHEMICAL NAME	Nitrogen	SYNONYMS	Not applicable
FORMULA	N ₂	CHEMICAL FAMILY	Not applicable
		MOLECULAR WEIGHT	28.01
TRADE NAME	Liquid Nitrogen		

II. HAZARDOUS INGREDIENTS

For mixtures of this product request the respective component Material Data Safety Sheets. See Section IX.

MATERIAL (CAS NO.)	Wt (%)	1992-1993 ACGIH TLV-TWA (OSHA-PEL)
Nitrogen (7727-37-9)	100	Simple asphyxiant (None currently established)

III. PHYSICAL DATA

BOILING POINT, 760 mm. Hg	-195.8°C (-320.4°F)	FREEZING POINT	-210°C (-345.8°F)
SPECIFIC GRAVITY (H ₂ O = 1)	0.808 @ -195.8°C	VAPOR PRESSURE AT 20°C.	Gas
VAPOR DENSITY (air = 1)	0.967	SOLUBILITY IN WATER, % by wt.	Negligible
PERCENT VOLATILES BY VOLUME	100	EVAPORATION RATE (Butyl acetate = 1)	High

APPEARANCE AND ODOR Colorless, odorless liquid.

EMERGENCY PHONE NUMBER

IN CASE OF EMERGENCIES involving this material, further information is available at all times:

Call CHEMTREC 800-424-9300 only in the event of chemical emergencies involving a spill, leak, fire, exposure or accident involving chemicals. For routine information contact your supplier.

This product is subject to the Pennsylvania Worker and Community Right-To-Know Act (35 P.S. Sections 7301-7320).

Praxair requests the users of this product to study this Material Safety Data Sheet (MSDS) and become aware of product hazards and safety information. To promote safe use of this product a user should (1) notify its employees, agents and contractors of the information on this MSDS and any product hazards and safety information, (2) furnish this same information to each of its customers for the product, and (3) request such customers to notify their employees and customers for the product of the same product hazards and safety information.

PRAXAIR, INC.

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IV. HEALTH HAZARD DATA

THRESHOLD LIMIT VALUE: See Section II.

EFFECTS OF A SINGLE (ACUTE) OVEREXPOSURE:

SWALLOWING—Frostbite may result from contact with liquid.

SKIN ABSORPTION—No evidence of adverse effects from available information.

INHALATION—Asphyxiant. Moderate concentrations may cause headache, drowsiness, dizziness, excitation, excess salivation, vomiting and unconsciousness. Lack of oxygen can cause death.

SKIN CONTACT—No harmful effect expected from vapor. Liquid may cause frostbite.

EYE CONTACT—No harmful effect expected from vapor.

EFFECTS OF REPEATED (CHRONIC) OVEREXPOSURE: No evidence of adverse effects from available information.

OTHER EFFECTS OF OVEREXPOSURE: Contact with liquid may cause frostbite.

MEDICAL CONDITIONS AGGRAVATED BY OVEREXPOSURE: The toxicology and the physical and chemical properties of the material do not suggest that overexposure is likely to aggravate existing medical conditions.

SIGNIFICANT LABORATORY DATA WITH POSSIBLE RELEVANCE TO HUMAN HEALTH HAZARD EVALUATION: None currently known.

EMERGENCY AND FIRST AID PROCEDURES:

SWALLOWING—This product is a gas at normal temperature and pressure.

SKIN CONTACT—For exposure to liquid, immediately warm frostbite area with warm water (not to exceed 105°F). In case of massive exposure, remove clothing while showering with warm water. Call a physician.

INHALATION—Remove to fresh air. Give artificial respiration if not breathing. Give oxygen if breathing is difficult. Call a physician.

EYE CONTACT—In case of splash contamination, immediately flush eyes thoroughly with water for at least 15 minutes. See a physician, preferably an ophthalmologist, immediately.

NOTE TO PHYSICIAN: *There is no specific antidote. Treatment should be directed at the control of symptoms and the clinical condition.*

HER 03468

V. FIRE AND EXPLOSION HAZARD DATA

FLASH POINT (test method)	Not applicable	AUTOIGNITION TEMPERATURE	Not applicable
FLAMMABLE LIMITS IN AIR, % by volume	LOWER	Not applicable	UPPER
			Not applicable

EXTINGUISHING MEDIA: Nitrogen cannot catch fire. Use media appropriate for surrounding fire.

SPECIAL FIRE FIGHTING PROCEDURES: Evacuate all personnel from danger area. Immediately deluge containers with water spray from maximum distance until cool. Move containers away from fire area if without risk. Do not discharge water sprays into Liquid Nitrogen.

UNUSUAL FIRE AND EXPLOSION HAZARDS: Liquid or vapor cannot catch fire. Closed container may rupture due to heat of fire. Liquid Nitrogen will freeze water rapidly. Containers are provided with pressure-relief devices that are designed to vent the contents when they are exposed to elevated temperatures. Liquid causes cryogenic "burns" (frostbite-like injury; see Section IV).

VI. REACTIVITY DATA

STABILITY		CONDITIONS TO AVOID: Heat (see Section IX).
UNSTABLE	STABLE	
	X	

INCOMPATIBILITY (materials to avoid): None currently known.

HAZARDOUS DECOMPOSITION PRODUCTS: None.

HAZARDOUS POLYMERIZATION		CONDITIONS TO AVOID: None currently known.
May Occur	Will not Occur	
	X	

VII. SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IF MATERIAL IS RELEASED OR SPILLED: Immediately evacuate personnel from danger area. Allow spilled liquid to evaporate. Shut off leak if without risk. Move leaking assembly to ventilated area or ventilate area of leak. Use self-contained breathing apparatus where needed. Test area, especially confined areas, for sufficient oxygen content prior to permitting re-entry of personnel.

WASTE DISPOSAL METHOD: Slowly release into atmosphere outdoors.

HER 03469

VIII. SPECIAL PROTECTION INFORMATION

RESPIRATORY PROTECTION (specify type): None required under normal use. However, air supplied respirators are required while working in confined spaces with this product. The respiratory protection use must conform with OSHA rules as specified in 29 CFR 1910.134.

VENTILATION

LOCAL EXHAUST—Use local exhaust system, if necessary, to prevent the build up of an oxygen deficient atmosphere.

MECHANICAL (general)—Acceptable

SPECIAL—None

OTHER—None

PROTECTIVE GLOVES: Loose-fitting cryogenic gloves.

EYE PROTECTION: Select in accordance with OSHA 29 CFR 1910.133.

OTHER PROTECTIVE EQUIPMENT: Metatarsal shoes for cylinder handling. Protective clothing where needed. Cuffless trousers should be worn outside the shoes. Select in accordance with OSHA 29 CFR 1910.132 and 1910.133.

IX. SPECIAL PRECAUTIONS

WARNING: Extremely cold liquid and gas. Contact with liquid or cold gas causes severe frostbite. Vapor can cause rapid suffocation due to oxygen deficiency. Protect containers against physical damage. Store and use with adequate ventilation. Close valve when not in use and when empty. Use piping and equipment adequately designed to withstand pressures and temperatures to be encountered. Do not get liquid in eyes, on skin or clothing.

MIXTURES: When two or more gases, or liquefied gases are mixed, their hazardous properties may combine to create additional, unexpected hazards. Obtain and evaluate the safety information for each component before you produce the mixture. Consult an Industrial Hygienist or other trained person when you make your safety evaluation of the end product. Remember, gases and liquids have properties which can cause serious injury or death.

Be sure to read and understand all labels and other instructions supplied with all containers of this product.

NOTE: Compatibility with plastics should be confirmed prior to use. For safety information on general handling of compressed gas cylinders, obtain a copy of pamphlet P-1, "Safe Handling of Compressed Gas in Containers," pamphlet P-12, "Safe Handling of Cryogenic Liquids," and pamphlet P-9, "The Inert Gases, Argon, Nitrogen and Helium," from the Compressed Gas Association, Inc., 1725 Jefferson Davis Highway, Suite 1004, Arlington, VA 22202.

OTHER HANDLING AND STORAGE CONDITIONS: Never work on a pressurized system. If there is a leak, close the cylinder valve, blow down the system by venting to a safe place, then repair the leak.

The opinions expressed herein are those of qualified experts within Praxair, Inc. We believe that the information contained herein is current as of the date of this Material Safety Data Sheet. Since the use of this information and these opinions and the conditions of use of the product are not within the control of Praxair, Inc., it is the user's obligation to determine the conditions of safe use of the product.

**GENERAL OFFICES**

Praxair, Inc.
39 Old Ridgebury Road
Danbury, CT 06810-5113

SAFETY PRECAUTIONS FOR NITROGEN

Nitrogen is a stable, colorless, odorless gas. Nitrogen makes up about 78 percent of the atmosphere.

WARNING

Nitrogen can cause rapid asphyxiation and death if released in confined, poorly ventilated areas.

Nitrogen as a liquid or a cold gas may cause severe frostbite to the skin or eyes. Do not touch pipes or valves with the bare skin.

Use a pressure-reducing regulator when withdrawing gaseous nitrogen from a cylinder or other high-pressure source.

KEEP EQUIPMENT AREA WELL VENTILATED

Nitrogen is non-toxic, but it can cause rapid asphyxiation in a confined area without adequate ventilation by diluting the oxygen concentration in the air to dangerously low levels. Nitrogen may replace normal air without warning that a non-life supporting atmosphere is developing. Liquid product is of special concern, because a small amount of liquid evaporates to create a large amount of gas. Because nitrogen is colorless, odorless and tasteless, it cannot be detected by the human senses. Any atmosphere which does not contain enough oxygen can cause dizziness, unconsciousness, or even death. OSHA regulations define an oxygen deficient atmosphere as one with an oxygen concentration of less than 19.5 percent.

Never enter any tank, pit or other confined area where these gases may be present until it has been purged with air and tested for a breathable atmosphere using a gas analyzer with a 0 to 25% scale. The oxygen content must be between 19.5 and 22 percent. Before entering any equipment that uses nitrogen, be sure all pipes, hoses, or ducts between it and the nitrogen source have been disconnected, blanked or otherwise positively closed off. Closing the valve is NOT a sufficient safety precaution. Monitor the oxygen content of the atmosphere as long as people are in the enclosed space. Persons working in confined spaces must be tethered with lifelines, and an observer must be stationed outside the entrance to continuously monitor their reactions. For further advice on confined space entry, obtain a copy of NIOSH publication 87-113, published by the U.S. Department of Health and Human Services.

NOTICE: Make certain that the information on this handout reaches each person who may use or come in contact with the product described on this sheet. This product is for use by trained personnel only. Additional copies of this handout are available from your UCISCO representative. Additional safety publications are listed on page 3 of this pamphlet.

AVOID CONTACT WITH LIQUEFIED GASES

Boiling always occurs when a warm container is filled or ambient temperature objects are placed in the liquid. Stand clear of boiling or splashing liquid and wear proper protective clothing. Never touch uninsulated pipes or vessels containing liquid nitrogen or the cold gas issuing from it. Both can cause severe frostbite, and the skin may adhere to the cold surface. Use tongs to lift objects in and out of the liquid nitrogen.

PROTECT EYES AND SKIN

Liquid nitrogen can be extremely cold. About -290 degrees Fahrenheit. Accidental contact with the liquid, or the cold gas issuing from it, may cause severe frostbite to the eyes or skin. Protect your eyes with safety goggles or face shield. Safety glasses without side shields do not give adequate protection. Cover the skin to prevent contact with the liquid or cold gas, or with cold pipes and equipment. Always wear gloves when handling anything that is, or may have been, in contact with the liquid. Special gloves made for cryogenic work are recommended, but leather gloves, without gauntlet that can be quickly and easily removed, may also be used. Long sleeves are recommended for arm protection. Wear cuffless trousers outside boots or over high top shoes to shed spilled liquid.

NEVER USE CONTAINERS, EQUIPMENT, OR REPLACEMENT PARTS OTHER THAN THOSE SPECIFICALLY DESIGNATED FOR USE IN NITROGEN SERVICE.

Be sure all containers, valves, regulators, hoses, etc. are designed for the intended use.

When handling liquid nitrogen, use only containers specifically designed for holding cryogenic liquids. Such containers are made from materials which can withstand the rapid changes and extreme differences in temperature that result. Even these special containers should be filled slowly to minimize the thermal shock. All such containers should be open or protected by a vent or other relief device which permits the vapors to escape without causing a rise in pressure. Inspect vents regularly to be sure that they are not plugged with ice condensed out of the air. Restricted vents can cause pressure build up which could damage or rupture the container.

UCISCO SALES AND SERVICE CENTERS

HOME OFFICE

222 Pennbright
Suite 300
Houston, Texas 77090
(713) 872-2188

NORTHERN

CHICAGO

P.O. Box 271
2024 North Lafayette Court
Griffith, Indiana 46319
(219) 923-0222

CLEVELAND

Two Summit Park Drive
Suite 450
Independence, Ohio 44131
(216) 573-3627

PHILADELPHIA

P.O. Box 1370
111 Connecticut Drive
Burlington, New Jersey 08016
(609) 386-4466

INSTITUTE

Route 25
P.O. Box 730
Institute, West Virginia 25112
(304) 768-7820

SARNIA

2540 Pioneer Avenue
Sarnia, Ontario
Canada N7S 5N6
(519) 332-0730

SOUTHWEST

LA PORTE

P.O. Box 1248
200 Strang Road
La Porte, Texas 77571
(713) 470-8888

LOUISIANA

3237 S. Burnside Avenue
Gonzales, Louisiana 70737
(504) 647-9797

TULSA

5444 South 108th East Avenue
Tulsa, Oklahoma 74146
(918) 663-6011

WESTERN

LOS ANGELES

10829 Etiwanda
Fontana, California 92335
(909) 829-4400

SAN FRANCISCO

1950 Loveridge Road
Pittsburg, California 94565
(510) 427-1950
(510) 427-1953

PACIFIC NORTHWEST

4115 Strider Loop
Bellingham, Washington 98226
(206) 734-3955

UTAH

12385 W. Alternate Highway 5
P.O. Box 306
Magna, Utah 84044
(801) 250-0567

EDMONTON

9020 24th Street
Edmonton, Alberta
Canada T6P 1X8
(403) 467-9000

HER 03474

REFERENCE MATERIAL

MATERIAL SAFETY DATA SHEETS

L-4630-E [E-4630-D In Canada] Liquid Nitrogen
L-4631-D [E-4631-C In Canada] Gaseous Nitrogen

LINDE SAFETY PUBLICATIONS AND GUIDELINES

L-14-033 Guidelines for Design and Installation of Industrial
Gaseous Nitrogen and Argon Distribution Piping
Systems.

COMPRESSED GAS ASSOCIATION (CGA) PUBLICATIONS

P-1 Safe Handling of Compressed Gases in Containers
P-9 The Inert Gases, Argon, Nitrogen, and Helium
P-12 Safe Handling of Cryogenic Liquids
P-14 Accident Prevention on Oxygen Rich and Oxygen
Deficient Atmospheres
SB-2 Oxygen Deficient Atmospheres

FEDERAL INFORMATION SOURCE

Federal Information Source
U.S. Department of Commerce
Springfield, VA 22161

NIOSH 87-113 Confined Space Entry (U.S. Department of Health
and Human Services)

EMERGENCY ASSISTANCE

If an emergency arises with a LINDE gas product in the United States,
Call:

PRAXAIR Hazardous Materials
Emergency Line
800-645-4633

or

Chemical Transportation Emergency Center (CHEMTREC)
800-424-9300

IN CANADA, CALL THE CANADIAN HELP HOTLINE:
(514) 640-6400

All numbers can be called 24 hours a day.

The information on this sheet has been extracted from Linde Form L-3499

NITROGEN, SAFETY PRECAUTIONS

USE PROPER PRESSURE REGULATORS

Prior to attaching a nitrogen regulator, inspect the regulator very carefully for physical damage or contamination and to ensure that it is properly sized and has the correct pressure rating for the intended service. Never use a damaged regulator.

Before attaching the regulator to withdraw gaseous nitrogen product, crack open the nitrogen supply valve for a moment to blow out any dust or dirt that might have accumulated in the nitrogen valve outlet. Connect the regulator to the valve and back out the pressure adjusting screw until it turns freely. While standing to one side of the regulator, open the nitrogen supply valve very slightly and very slowly to allow the gauge to move up to nitrogen supply pressure. Then, open the nitrogen supply valve all the way.

EXERCISE CAUTION WHEN DISPOSING OF WASTE GAS OR LIQUID

Gaseous nitrogen should be released only in an open outdoor area. Liquid nitrogen should be discharged into a remote, outdoor, gravel filled pit where it will evaporate safely.

FIRST AID

If symptoms of asphyxia such as headache, drowsiness, dizziness, excitation, excess salivation, vomiting, or unconsciousness are observed, remove the victim to fresh air. If breathing is difficult, give oxygen. If breathing has stopped, give artificial respiration. Call a physician promptly.

If exposure to cryogenic liquids or cold gases occurs, restore tissue to normal body temperature (98.6 degrees F) as rapidly as possible, then protect the injured tissue from further damage and infection. Call a physician immediately. Rapid warming of the affected part is best achieved by bathing it in warm water. The water temperature should not exceed 105 degrees F, and under no circumstances should the frozen part be rubbed, either before or after rewarming. If the eyes are involved, flush them thoroughly with warm water for at least 15 minutes. In case of massive exposure, remove clothing while showering with warm water. The patient should not drink alcohol or smoke. Keep warm and at rest. Call a physician promptly.

Refer to the Material Safety Data Sheets, L-4630 Liquid Nitrogen or L-4631 Gaseous Nitrogen, for detailed descriptions of the symptoms of overexposure and the first aid to be used.

PIPING SYSTEMS

Working safely with nitrogen requires safe piping systems, proper control equipment, and safe handling of any containers involved. The purpose of this handout is not to discuss cylinder handling or the design of distribution systems. However, a few of the major safety considerations are given below.

Never install equipment or piping for liquid nitrogen or the cold vapors issuing from it, without consulting someone thoroughly experienced in low temperature work. Piping must be of a material suitable for the type, pressure, and temperature of the gas being handled. Remember, certain materials (e.g., carbon steels) lose ductility and impact strength at cryogenic temperatures, and for many systems such exposure is possible.

Linde provides booklet L-14-033, Guidelines for the Design and Installation of Industrial Gaseous Nitrogen / Argon Distribution Piping Systems to assist you with the design and installation of piping systems.

When installing a piping system, you should observe standards published by the National Fire Protection Association. Mark piping in accordance with American National Standards Institute A 13.1, "Scheme for the Identification of Piping Systems," and label all piping with the name of the gas being carried. You should obtain a copy of the appropriate brochures and be sure that your system meets the recommended standards.

A suitable pressure relief device must be installed between each pair of shut off valves for all systems handling liquefied or cold nitrogen. Liquefied or cold nitrogen expands as it warms, and, if trapped between two valves, the expanding gas could create a very high pressure and cause piping or control equipment to rupture explosively.

When withdrawing gaseous product from a portable cryogenic liquid container with an integral vaporization coil, do not exceed the manufacturer's recommended withdrawal rates for the container. Excessive gas withdrawal rates may result in discharge of liquid or cold gas which can damage equipment into which the product is flowing.

IMPORTANT

Nitrogen has properties that can cause serious accidents, injuries, and even death if proper precautions and safety practices are not followed. Therefore, during handling and use of nitrogen, or during the operation and maintenance of equipment and systems using nitrogen, be certain to follow the applicable safety precautions described in this handout and in the Material Safety Data Sheets, safety standards, and other literature referenced in this handout. Manufacturer's operating instructions for equipment using nitrogen are to be followed exactly.